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**PATENT
DKT. STL10271**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Arnold G. Slezak
Assignee: Seagate Technology LLC
Filed: June 29, 2004
Application No.: 09/981,556
For: **METHOD TO REDUCE SERVO PATTERN RUNOUT ON A PRE-WRITTEN DISK**

Group Art: 3729

Examiner: Tugbang, Anthony D.

Mail Stop Appeal Brief - Patents
Commissioner for Patents
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Alexandria, Virginia 22313-1450

ATTENTION: Board of Patent Appeals and Interferences

APPELLANT'S REPLY BRIEF

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THE OFFICE'S CONSTRUCTION OF THE LANGUAGE OF INDEPENDENT CLAIM 1 IS REVERSIBLE ERROR

Claim 1 recites in pertinent part: *placing prewritten discs, each characterized by servo tracks that are offset in relation to a common angular reference axis of each disc, around a motor hub, the prewritten discs placed with respect to each other disposing the angular reference axes symmetrically around the motor hub....*

"The rules of the PTO require that application claims must "conform to the invention as set forth in the remainder of the specification and the terms and phrases used in the claims must find clear support or antecedent basis in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description."¹ Thus, during examination claims are given their "broadest reasonable interpretation consistent with the specification."² The "broadest reasonable interpretation" is the meaning that the skilled artisan would give to the claim term in view of the associated usage provided in the specification.³ A construction that is inconsistent with the written description would not be arrived at by the skilled artisan, and is therefore not a "reasonable interpretation."⁴

1. *offset*

Applicant has consistently maintained its position that the skilled artisan would conclude that a reasonable interpretation of *offset* is the nonconcentricity of the servo tracks with respect to the disc. The Office's rebuttal position in its Answer is as follows:

First, the appellants assert that the term "offset" is shown in Figure 2 and is plainly disclosed in the specification. That somehow, the term offset means that the "servo tracks are nonconcentric in relation to the disc center". The examiner urges that this statement by the appellants is false as Figure 2 shows no such offset.⁵

The specification specifically describes, what the skilled artisan readily knows, the ideal servo pattern as being made of tracks of servo information that are concentric to disc rotation.⁶ In addition to the title itself, the specification repeatedly emphasizes that the

¹ *Phillips v. AWH Corp.*, 75 USPQ2d 1321 (Fed. Cir. 2005)(en Banc), quoting 37 C.F.R. § 1.75(d)(1).

² *Phillips, supra*; MPEP 2111

³ *In re American Academy of Science Technical Center*, 70 USPQ2d 1827 (Fed. Cir. 2004); *In re Cortright*, 49 USPQ2d 1463, 1468 (Fed. Cir. 1999); *In re Morris*, 44 USPQ2d 1023 (Fed. Cir. 1997)

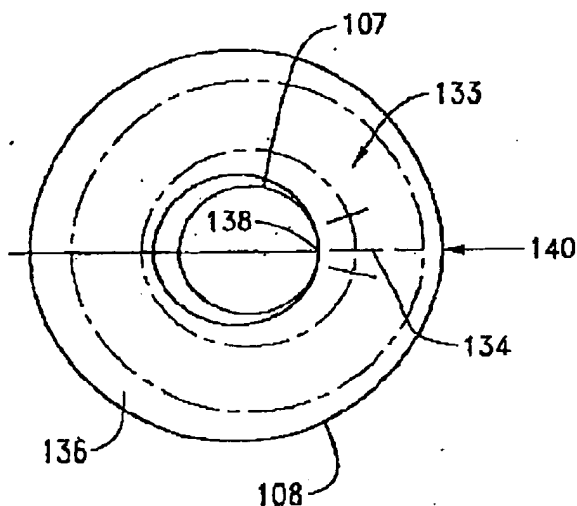
⁴ *Phillips, supra*; *In re Morris, supra*; *In re Zletz*, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989)

⁵ Examiner's Answer pg. 6 lines 9-12, emphasis added.

⁶ Specification pg. 2 lines 18-19.

claimed embodiments are beneficial for reducing servo pattern runout, or in other words reducing the nonconcentricity of the servo pattern with respect to the disc rotation.⁷

FIG. 2 of the specification is an exaggerated depiction⁸ of an intentional misalignment of the prewritten disc 108 and the spindle motor hub 107 in the data storage device 100. Some amount of misalignment is inherently present, due to the clearance that is necessary between the disc 108 inner diameter and the hub 107 outer diameter so that the discs 108 can be readily placed around the hub 107.



The prewritten disc 108 is biased against the hub 107 by a force 140 acting in the direction of an angular reference axis 134. Therefore, the prewritten disc 108 itself is nonconcentric with respect to the hub 107 rotation. If the servo tracks had been written concentrically with respect to the disc 108, then in FIG. 2 they would likewise be nonconcentric with respect to hub 107 rotation, which would be contrary to the claimed embodiments. However, the dotted lines represent a pattern of concentricity with respect to the hub 107 axis of rotation.⁹ The skilled artisan, having read the specification, readily understands that matching the servo pattern written to the disc 108 to the concentricity pattern depicted in FIG. 2 disposes the servo pattern concentric with respect to the hub 107 rotation, effectively compensating for the inherent misalignment between the disc 108 and the hub 107.

⁷ See, for example, specification pg. 3 lines 10-12, pg. 6 lines 3-4, pg. 8 lines 11-13.

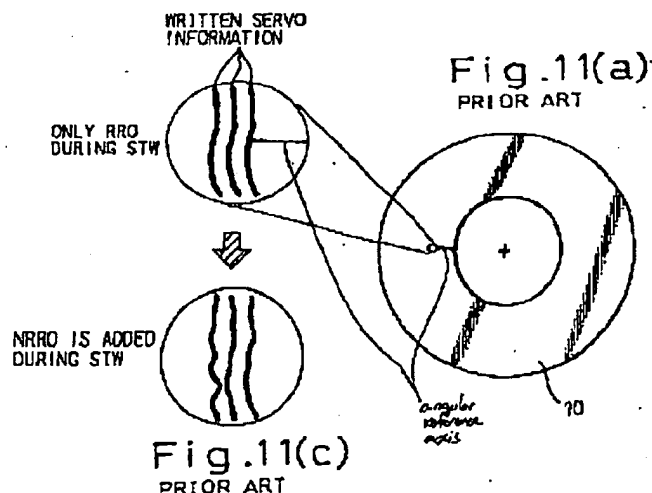
⁸ Specification pg. 5 lines 26-29.

⁹ Specification pg. 5 lines 29-30.

The skilled artisan also readily understands that the concentricity pattern depicted in FIG. 2 is *offset* with respect to the disc 108. That fact is clear from the unequal spacing between the concentricity pattern and the disc 108 edge at different circumferential locations of the disc 108. In fact, the skilled artisan readily understands that because the disc 108 is biased in relation to angular reference axis 134, which for argument sake appears to be at zero degrees, the minimum spacing due to the offset is at zero degrees and the maximum spacing due to the offset is at 180 degrees.

Therefore, contrary to the Office's rebuttal, the skilled artisan having read the specification clearly understands that the meaning of "offset" in claim 1, consistent with its plain meaning and its depiction in the specification, would reasonably include the offset of the pattern of concentricity with respect to the disc 108 that is depicted in FIG. 2 and the descriptions thereof. The Office's position that FIG. 2 does not show such an offset is reversible error. Therefore, Appellant believes the evidence in the record shows that the broadest reasonable interpretation of the term "offset" must include the offset of the concentricity pattern with respect to the disc 108 that is depicted in FIG. 2 of the specification.

Following is FIG. 11 of Kuroba '990 which Appellant has marked up to depict an angular reference axis of the disc 10 to aid in illustrating the Office's stated interpretation of the claim term "offset":



The Office's interpretation is as follows:

So Kuroba discloses that the discs would each have servo tracks with directions of these tracks placed along each surface of each disc (see Fig. 11a through 11c), diametrically around the motor hub. The direction and location of these servo tracks formed directly on the surface of the discs would be offset in nearly an orthogonal manner or nearly a perpendicular relationship when compared to the direction of the common angular reference axis.¹⁰

The Office's position is that the circular servo tracks in Kuroba '990 are "offset" from the radial angular reference axis because they are disposed substantially orthogonal to each other. However, the plain meaning of "offset" considered in the context of the claim language conveys a meaning associated with some compensation factor. Orthogonally directed lines are not ordinarily referred to as being "offset" unless they are so disposed in order to provide compensation for something. The skilled artisan readily understands that the servo tracks in Kuroba '990 are not orthogonal to the angular reference axis in order to compensate for anything; they are simply orthogonal as the result of a circular object intersecting a radial object. Contrarily, the plain meaning of "offset" is consistent with the nonconcentric disposition of the servo pattern with respect to the disc 108 as depicted in FIG. 2, because so disposing the servo pattern reduces RRO.

The Office has provided no evidence as to why a skilled artisan would conclude that the servo tracks in Kuroba '990 are "offset" simply because they are orthogonally disposed to the angular reference axis. The Office's stated interpretation of "offset" is inconsistent with both the plain meaning of the term and inconsistent with the depicted offset of the concentricity pattern in FIG. 2 of the specification. As such, Appellant believes that the Office's stated interpretation of "offset" is not within the broadest reasonable interpretation, but rather it is reversible error.

2. common angular reference axis

The language of claim 1 explicitly features the prewritten discs as having *servo tracks that are offset in relation to a common angular reference axis of each disc*. In other words, the prewritten discs have servo tracks that are already offset in relation to the common angular reference axis before the prewritten discs are placed around the motor hub and biased, when considered in the context of the other claim language.

¹⁰ Answer, pg. 8 lines 3-8, emphasis added.

That interpretation is consistent with the Director's interpretation when deciding on Appellant's Rule 181 Petition:

Currently, claim 1 requires placing discs having servo tracks that are offset, placing the discs around a motor hub, and biasing each disc to concentrically align the servo tracks.¹¹

However, the Office acknowledges that the prewritten discs already have the servo information, while nonetheless inconsistently interpreting the "common angular reference axis" in Kuroba '990 as being the direction of biasing the disc after it is assembled in the disc drive:

The prewritten discs each have servo track information written on the surface of the disc where examples of how servo track information are formed on the disc surface being shown in Figures 11a and 11b. This servo track information is done prior to assembling the discs on a motor hub of a disc drive. The "common angular reference axis" has been interpreted by the examiner as any axis (i.e. line) along each disc used to bias or balance the disc with the prewritten servo track information on the motor hub (spindle 21).¹²

The skilled artisan readily recognizes that the Office's interpretation of this disputed term effectively ignores the claim language which plainly features the prewritten disc already having the servo information offset in relation to the common angular reference before the placing and biasing steps. The Office has provided no evidence as to why a skilled artisan would agree that the "common angular reference axis" can be any biasing axis when the claim features the "common angular reference axis" necessarily being defined before biasing begins. The Office's stated interpretation of "common angular reference axis" is inconsistent with the plain meaning of the claim language and effectively ignores explicitly recited claim language. As such, Appellant believes that the Office's stated interpretation of "common angular reference axis" is not within the broadest reasonable interpretation, but rather it is reversible error.

¹¹ Decision on Petition mailed 5/2/2007.

¹² Answer, pg. 7 lines 13-19, emphasis added.

**THE OFFICE'S SECTION 102 REJECTION IS REVERSIBLE ERROR BECAUSE
IT HAS NOT SUBSTANTIATED EVIDENCE THAT KUROBA '990 DISCLOSES
ALL THE FEATURES OF THE REJECTED CLAIMS**

1. servo tracks that are offset in relation to a common angular reference axis

Claim 1 recites in pertinent part: *placing prewritten discs, each characterized by servo tracks that are offset in relation to a common angular reference axis of each disc....*
The angular reference axis 134 in FIG. 2 above was considered to be at zero degrees for the sake of discussion. Therefore, if a three-disc stack is made according to the claimed embodiments then all three discs have servo tracks written to them that are offset in relation to the same angular reference axis, such as the zero degree reference axis depicted in FIG. 2. That advantageously permits writing the servo tracks to all three discs in one setup, and even writing the servo tracks to all three discs simultaneously. After the discs have been servowritten, they are then placed around the motor hub so that the common angular reference axes are disposed symmetrically. In this case, the three common angular reference axes would be disposed 120 degrees apart. Therefore, claim 1 features a plurality of discs having servo tracks that are written offset in relation to a common angular reference axis of each disc, but yet each disc has a different contact position against the motor hub in the disc drive during disc biasing.

Appellant has repeatedly shown that Kuroba '990 discloses a different solution whereby each of the three discs in the example above would have to be written individually with respect to its contact position against the motor hub in the disc drive during disc biasing:

If a plurality of disk media 20 are stacked, a balance control can be attained by the following manner. The position at which the inner periphery of the disk medium comes into contact with the outer periphery of the spindle hub is changed alternately one by one at positions symmetrically with respect to the axis E of rotation. Otherwise, the contact position is changed by a certain angle, one after another, for the respective disks. However, in a case of the data surface servo system, the servo track writing (STW) must be performed individually for the groups of disks in which the contact position is changed for the respective groups.¹³

Appellant has also repeatedly pointed out that the skilled artisan readily recognizes that the only reason that the discs in Kuroba '990 must be written in groups according to their

respective contact positions in the disc drive is that the servo pattern offsets are written in relation to different angular reference axes. If they were written in relation to a common angular reference axis, as in the claimed embodiments, then there would be no necessity to write them individually as Kuroba '990 mandates. The Office has not provided any evidence as to why the skilled artisan would conclude that Kuroba '990 discloses *placing prewritten discs, each characterized by servo tracks that are offset in relation to a common angular reference axis of each disc, around a motor hub* in view of the fact that Kuroba '990 expressly discloses writing the servo tracks in groups related to their contact positions in the disc drive. In fact, the Office has never even acknowledged Appellant's evidence in this regard.

Therefore, the Office's stated rationale for the rejection of claim 1, which in substance is essentially a recital of the claim language, is reversible error for lacking substantiating rebuttal evidence in view of Appellant's evidence that *servo tracks that are offset in relation to a common angular reference axis* featured in claim 1 patentably distinguishes over Kuroba '990:

Kuroba discloses a method comprising: placing prewritten discs 20, each characterized by servo tracks that are offset in relation to a common angular reference axis around a motor hub (spindle 21), the prewritten discs placed with respect to each other disposing the angular references axes symmetrically around the motor hub;¹⁴

2. *biasing each disc...to concentrically align*

Claim 1 recites in pertinent part: *biasing each disc in a direction of the respective angular reference axis to concentrically align the servo tracks of a first disc of the prewritten discs with the servo tracks of a second disc of the prewritten discs.*

The Office's rationale for the rejection of claim 1 is based on Kuroba '990 disclosing writing some portion of the servo tracks after the discs are biased in the disc drive:

Biasing is what Kuroba discloses as the force necessary to balance each disc on the motor hub (e.g. col. 8, lines 32+), or the force necessary to shift the prewritten disc to align the discs with the motor hub (e.g. col. 7, lines 4-13). Since each disc would be biased in alignment, the prewritten servo track information on each disc would therefore also be in alignment. Alignment of the pre-written servo track

¹³ Kuroba '990, col. 8 lines 38-41, emphasis added.

¹⁴ Answer pg. 3 lines 11-14.

information must occur, because Kuroba performs a subsequent completion of servo track writing (STW) after the discs are aligned and biased on the motor hub (col. 7, lines 14-24).¹⁵

However, claim 1 expressly features the concentric alignment of servo tracks of different discs being accomplished by the placing and biasing steps. That is, the servo tracks already existing on the prewritten discs are concentrically aligned by placing and biasing the discs according to the language of claim 1. The Office cites Kuroba '990 taking an additional step of writing servo tracks after the discs have been placed and biased. The Office has not provided any evidence as to why the skilled artisan would conclude that Kuroba '990 discloses *biasing each disc...to concentrically align...* in view of the Office's evidence that Kuroba '990 in fact preferably writes the servo tracks as an additional step after biasing the discs.

Therefore, the Office's stated rationale for the rejection of claim 1, which in substance is essentially a recital of the claim language, is reversible error for lacking substantiating rebuttal evidence in view of Appellant's evidence that *biasing each disc...to concentrically align* featured in claim 1 patentably distinguishes over Kuroba '990:

and biasing each disc in a direction of the respective angular reference axis to concentrically align the servo tracks of a first disc of the prewritten discs with the servo tracks of a second disc of the prewritten discs (see various embodiments of Figures 1a, 4, 7a, 7b, 8a, and 8c).¹⁶

3. first indicia on one side...second indicia...on the other side....

Claim 9 ultimately depends from independent claim 1 and further recites in pertinent part: *placing prewritten discs with each comprising a first indicia on one side of the prewritten disc associated with the angular reference axis and a second indicia associated with the angular reference axis and different than the first indicia on the other side of the prewritten disc.*

The Office's rationale for the rejection of claim 9 is altogether void of any substantiating evidence:

The first and second indicia of Kuroba can be said to be on different sides of the disc to the same extent that the

¹⁵ Answer, pg. 8 lines 16-22, emphasis added.

¹⁶ Answer pg. 3 lines 14-17.

applicant's first and second indicia are on different sides of the disc.¹⁷

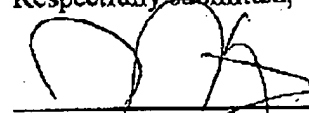
The Office's stated rationale for the rejection of claim 9, which in substance is essentially supposition, is reversible error for lacking substantiating rebuttal evidence in view of Appellant's evidence that *first indicia on one side...second indicia...on the other side....* featured in claim 9 patentably distinguishes over Kuroba '990:

Conclusion

To substantiate anticipation in terms of Section 102, every element of the claimed invention must be identically shown in a single reference and arranged as in the rejected claim.¹⁸ For at least the reasons set forth above and otherwise in the record, the Office has not substantiated evidence that the cited reference identically discloses all the features recited by the language of the claims. Appellant therefore respectfully requests that the rejection of claim 1 and the claims depending therefrom be reversed.

Respectfully submitted,

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¹⁷ Answer pg. 4 lines 14-16, emphasis added.

¹⁸ *In re Bond*, 15 USPQ2d 1566 (Fed. Cir. 1990).